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ABSTRACT

This learning module has been designed to aid the teacher trainee in identifying ways in which he influences student behavior in the classroom and also explores means of selecting more meaningful reinforcers and their application. Terminal objectives of the module are the ability to (1) define the terms "reinforcement," "positive reinforcement," "negative reinforcement," "punishment," and "extinction"; (2) state five principles of reinforcement; and (3) describe a strategy for selecting an appropriate reinforcer for a specific learning task for a student in the teacher's classroom. Included in the module are pre- and post-test forms, a handout on principles of reinforcement, and a suggested reading list of appropriate references. (MB)

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DIAGNOSIS AND PRESCRIPTION: REINFORCEMENT MODULE

Middle School Teacher Corps Program

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DIAGNOSIS AND PRESCRIPTION OF REINFORCERS

I. Terminal Objectives

At the conclusion of this module the teacher will be able to:

1. State the definition of the following terms.
   a. Reinforcement.
   b. Positive reinforcement.
   c. Negative reinforcement.
   d. Punishment.
   e. Extinction.
2. State five principles of reinforcement.
3. Describe a strategy for selecting an appropriate reinforcer for selecting an appropriate reinforcer for a specific learning task for a student in his classroom.

II. Pre-test (100% accuracy).

1. Define the following terms:

   a. Reinforcement.

   b. Positive reinforcement.

   c. Negative reinforcement.

   d. Punishment.

   e. Extinction.

2. State and give an example of three kinds of reinforcement.

3. State five principles of reinforcement.

4. State and give an example of three types of reinforcement schedules.

5. Describe a strategy for selecting an appropriate reinforcer for a specific learning task for a student in your classroom. Include in your description:

   a. The learning task.

   b. The specific reinforcer.

   c. The schedule of reinforcement.

   d. Strategy used to determine reinforcer.

III. Post-test (100% accuracy)

1. Define the following terms.

   a. Reinforcement.

   b. Positive reinforcement.

   c. Negative reinforcement

   d. Punishment.

   e. Extinction.

2. State and give an example of three kinds of reinforcement.

3. State five principles of reinforcement.

4. State and give an example of three types of reinforcement schedules.

5. Describe a strategy for selecting an appropriate reinforcer for a specific learning task for a student in your classroom. Include in your description:

   a. the learning task.

   b. The specific reinforcer.

   c. The schedule of reinforcement.

   d. Strategy used to determine reinforcer.

IV. Instructional Activities

The teacher influences student behavior in the classroom whether the behavior is desirable or undesirable. The teacher should be aware of what it is that he does to influence behavior. Behavior is changed by its consequences. If the consequences of the student's behavior are satisfying to him, the behavior will occur more frequently or with greater strength in the future. If the consequences are unsatisfying or aversive, the behavior will be weakened or will occur with decreased frequency. Many students are hindered in their learning because they are not responsive to the events provided as reinforcers. This module will explore means of selecting more meaningful reinforcers and their application.

There are at least two reasons why the teacher should become aware of the specific use of reinforcement in the classroom. The first is that the teacher already reinforces or fails to reinforce by his daily actions in the classroom. The second is that reinforcement is an effective tool for directing behavior.

Complete the instruction in this module by reading and studying the handout in this module. Competence to perform the terminal objectives may also be developed by discussions with other teachers, your team leaders, University Consultants, or by reading the references below.

Meacham, M.L., B. Wiesen, A.E., Changing Classroom Behavior: A Manual for Precision Teaching, Scranton, Pa.: International Textbook Co., 1969.

Peter, L.J., Individual Instruction, New York: McGraw-Hill, 1972.

Stephens, T.M., Directive Teaching of Children With Learning and Behavioral Handicaps, Columbus, Ohio; Charles E. Merrill Pub. Co., 1970.

Handout

Diagnosis and Prescription of Reinforcers

Reference:

Meacham, M.L. I. Wiesen, A.E., Changing Classroom Behavior: A Manual for Precision Teaching, Scranton, Pa.: International Textbook Co., 1969, p.37-61.

Principles of Reinforcement

Most behavior is affected by its consequences, i.e., the probability of its occurring again is directly related to the effect it has on securing positive or negative outcomes from the environment. Something like the pupilary reflex may not fit this paradigm, but teachers are rarely interested in exerting control over pupilary reflexes as a continuing part of classroom management. However, teachers are interested in many other things that children do such as reading, writing, talking, walking, running, spelling, fighting, whispering, etc. The list is endless. These behaviors are affected by their consequences and belong to a general class that psychologists call operant, since they "operate" on the environment to secure various outcomes. They are also often thought of as voluntary behaviors as opposed to reflexive behaviors.

Teachers control many important consequences for students. They give praise; they punish; they give grades; they give and take away privileges; they sometimes ignore both good and bad behavior. With systematic application of these consequences, they can influence important student behaviors. They can increase the probability of some behavior occurring again by reinforcing it, or they can decrease this probability through some form of punishment or by instituting a procedure called extinction. Let us examine these processes closely for they are central to improved classroom operation. Careful control of these three kinds of consequences will help any teacher improve the quality of his instruction and the social climate of the classroom.

A reinforcement is an environmental event that increases the rate of a response which it follows. Praise a child for picking up some trash from the playground and it is highly likely that he will do it again, since praise is a very common form of social reinforcement. Likewise, smiles, hugs, money, candy, and awards of various kinds are frequently reinforcing for the behavior which they follow. There are an almost infinite variety of reinforcements, and we will look at the most important of these later in this chapter.

Reinforcements are sometimes categorized as positive and negative. Praising a child involves the use of positive reinforcement because you are presenting a stimulus (praise) that follows the desired behavior (picking up trash). Negative reinforcement consists of removing something that could be punishing, so the child avoids or escapes the punishing event by doing whatever is required. Negative reinforcement is one of the most common methods used to control the behavior of children and adults, and it most often takes the form of a threat. "If you don't finish your work, Cyril,

you will have to stay in at recess." Presumably, Cyril will finish his work in order to avoid staying in the classroom at recess since being in the classroom at this time would be unpleasant or punishing. Then the teacher removes (verbally) the punishing event, Cyril goes happily outside to play with the other children, and we hope that his "finishing-work-on-time" behavior is reinforced by avoiding unpleasant consequences.

If one stops to think for a moment of the use of traffic citations, it is obvious that our own behavior is also controlled to a considerable degree by means of negative reinforcement. Traffic officers do not, as a rule, stop people to praise them for their driving well (this would be positive reinforcement), but they do constantly pose a threat of issuing a citation for improper driving. This threat is carried out just often enough to keep most of us honest. However, it has an interesting side-effect which we will discuss in more detail later. Most of us don't really like the people who give us citations.

However, parents and teachers as well as society in general use this type of control often because it is easy to administer. It requires the presentation of a threat, usually through some verbal means, and then the removal of the threat following compliance. One doesn't really have to do anything, just think of appropriate threats. However, if negative reinforcement is to continue to be effective it must occasionally be backed up. The youngster will have to stay in at recess, and we will have to receive a citation or two. At this point we are dealing with punishment.

Punishment is an environmental event which decreases the rate of the response which it follows. Adults use many kinds of punishment with children, from the physically painful to the psychologically painful. While there are generally some limits placed on how physically violent a teacher can become, there are plenty of opportunities for denial of privileges or shaming a student in front of his peers. However, punishment may and often does have some undesirable side effects that are detrimental to learning. The child may learn to avoid the teacher-punisher and develop a tendency to avoid school entirely. In view of this it seems strange that many schools use as the ultimate punishment expelling. If indeed school has become so aversive that the youngster cannot conform to the regimen, then expelling him must be highly reinforcing for that very behavior the school personnel are trying to alter. True, his parents may become much more punishing so as to force him back into a school situation that is the "lesser of two evils." However, it somehow seems preposterous to confine a child in school primarily to avoid punishment of a higher order. We will be more deeply concerned about the effects of punishment in Chapter 5. Let us turn our attention now to another outcome which influences operant behavior, extinction.

In addition to reinforcement and punishment, there is another class of outcomes following behavior in which essentially nothing happens--at least nothing that can be classified as either reinforcing or punishing. We call this process extinction, and when it happens consistently, the behavior it follows decreases in rate until it is finally extinguished. This is a very common classroom practice, and teachers who set out to ignore certain behaviors with the idea that they will eventually "go away" are practicing extinction.

That is, they are if they consistently and absolutely ignore the behavior, something that is not always easy to do.

These processes (reinforcement, punishment, and extinction) do not themselves distinguish between desirable and undesirable behavior. A teacher can extinguish desirable behavior by ignoring it just as easily as undesirable behavior, and perhaps more easily. This is because the latter is frequently reinforced by peers. If a child is consistently ignored when he raises his hand to volunteer, he will gradually cease to volunteer. On the other hand, a child who is consistently reinforced by teacher attention for deviant behavior will continue that behavior. If a teacher ridicules a child who is trying to answer a question, we would predict that he will reduce his participation as the teacher asks later questions. That behavior which is ignored will extinguish. That behavior which is reinforced will increase. That behavior which is punished will decrease. It all sounds very simple, but it requires careful consideration. For it is not always easy to ascertain just what is reinforcing and what is punishing for any individual child. It also requires alertness to administer consequences in a consistent manner since this is something we ordinarily do not do. However, for those teachers who master these processes and make judicious use of planned outcomes as consequences for student behavior, the reward is a more predictable classroom in terms of both learning and social behavior. Next, let us take a look at several principles that are basic to the utilization of reinforcement, punishment, and extinction with the purpose of refining our use of these variables.

Jack Michael (1967), in a splendid monograph on the arrangement of behavioral consequences in education, suggests several principles which are particularly appropriate for teachers intending to utilize behavioral techniques in their classrooms. These should be examined closely for they delineate clearly how the teacher may use consequences to the best possible advantage.

1. First, consequences (reinforcers and punishers) are defined only in terms of how they affect the learner, not how the teacher thinks they might affect the learner or how the same consequences have affected other learners. Nothing is truly a reinforcer for any child until it has been tried out and has been seen to increase that child's rate of response. Thus there is no priori test of what is reinforcing or punishing; the only test is to try something and measure the effects.

However, the experienced teacher may make some educated guesses based on his experience or knowledge of the research literature. These will very often be accurate guesses because there are many kinds of things which have been shown to be reinforcing to many children. But, while most children respond to praise, some do not; while most people respond to money, some do not. It is this occasional person who does not respond to the usual or normal contingencies that makes this first principle so important. We can never be sure something will work until we try it.

Another complicating aspect is that the reinforcing characteristics of a stimulus will change from one situation to another. An adolescent may respond to praise only from his peers but not from the teacher. There are also hierarchies of reinforcement, i.e., for any person some reinforcers are more

powerful than others. A child may respond reasonably well with verbal approval from the teacher but really blossom when given a pat on the head or a hug. These are two forms of social approval, and while one might expect children to respond equally well to both, this is not necessarily so. Our experience has suggested that many children who have difficulty with verbal expression are more responsive to nonverbal reinforcement. However, this is an impression and not the result of controlled research.

Another problem concerns the use of outcomes which the teacher believes to be punishing but which are really reinforcing. Scolding a student or arguing with him until you "win" may seem to be aversive to the student from the teacher's point of view. However, teacher attention is a very powerful reinforcer for many children, and to these youngsters any attention is better than none. So the behavior continues or increases and the teacher attention (scolding, arguing, etc.) also increases. This can get to be a pretty trying experience! The only criterion that the teacher can use, then, to determine the nature of the stimulus event is the effect it has on the behavior of the individual student. This provides an objective and systematic way of determing what is maintaining behavior. And if behavior is being maintained, it is being reinforced. With systematic observation and consistent measurement there is no guess work. We can proceed with modifications on the basis of knowledge, not on the basis of intuition.

2. A second principle for the utilization of consequences in the classroom is that the effects of reinforcement or punishment are automatic. The learner does not need to know or be able to verbalize about these consequences. Thus it is not absolutely necessary that the teacher and the student enter into some sort of verbal or written contract to effect positive change, although this is one ethical form of carefully spelling out the rules of the game and works very well with some children. This is especially important if the children are involved in keeping and recording some of the data so that they know where they stand at all times.

However, the work with very deviant children (austistic, schizophrenic, severely brain-injured) such as that reported by Lovaas and his associates (1966) clearly illustrates the automatic effects of consequences. The children that Lovaas worked with were mute, and his task was to teach them language. This was done by careful step-by-step training with reinforcement at every step. First the psychologists had to get the youngster to attend, then it was necessary to gradually develop imitative behavior, then to shape sounds and finally, words. It was quite obvious that these children could not verbalize about the relationship between their behavior and the consequences, nor was there any other indication that they "understood" (at least at first) about this relationship. Nevertheless, they learned rather complex verbal behavior through these techniques. We would recommend these studies, many of which are described in Chapter 12, for any teacher who is interested in the minute steps that are necessary to accomplish learning goals for certain children and in the careful control of consequences that contribute to this learning.

3. A third principle in behavioral management is that the consequences, whether reinforcement or punishment, should be very closely related to the

desired terminal behavior. We use "terminal" here to mean the immediate goal of the teacher, not the long range goal. This means that the teacher must be aware of exactly what it is he is trying to reinforce and then make certain that the reinforcement is contingent only on that behavior. For example, if accuracy in spelling is the goal and the teacher wishes to increase the number of correct responses a child can make in a given spelling assignment, then the teacher should reinforce the student for accuracy rather than for the amount of time spent on the assignment regardless of accuracy. While it may be appropriate to praise a child for "sticking to his assignment" regardless of accuracy, we must recognize that in such an instance we are basically reinforcing time spent and should not be too disappointed if the accuracy rate does not improve.

We recently had occasion to observe a third-grade boy who had been referred for a reading problem. As it turned out, his problem seemed to be primarily related to oral reading rather than silent reading, since he gave sufficient evidence for us to ascertain that he comprehended materials quite adequately when he read silently. We then discovered that as a consequence of his problem with oral reading, he was receiving the special attention of his own teacher, a remedial reading teacher, his mother, and to round it out, his grandmother. All of these people were to some extent involved in the remediation process, i.e., helping him with his reading problem, and there may have been still others of whom we were not aware such as siblings and his father. Assuming that attention from others, particularly adults, was very reinforcing for him (and we had evidence of this by observing his "attention getting" behaviors in other situations), he was being heavily reinforced for his problem behavior. Thus the more difficulty he had with oral reading, the more people he got involved with (including us!) and the more attention he received. We were all reinforcing the exact behavior we wanted to eliminate. So we gave instructions to reinforce him only for successful oral reading and to put the problem behavior on extinction by not attending to it. In this process we started him with reading materials we knew he could handle adequately so that he could emit the desired behavior and obtain reinforcement in the form of praise and attention. This little boy had been well on his way to establishing a persistent pattern of manipulating adults through his "infirmities" simply because he had learned that these deficiencies got the attention he craved so much. When we look at behavior, and particularly at what is being reinforced, we must pay very close attention to be certain that it is the educational goal that is being achieved and not something that is diametrically opposed or only tangential to our objectives.

4. A fourth principle involves consistency. The teacher must be consistent in how he responds to a child if he wishes to achieve specific educational objectives in a predictable manner. This is certainly not a new rule in dealing with children for psychologists have been urging it on parents and teachers for many years. The rationale, simply stated, has been that a child will feel more sure of himself and less anxious if the people around him behave in a reasonably consistent and predictable manner. From our point of view, the evidence is quite strong that consistency in the management of consequences is necessary if one is to know what is making the difference in the child's general behavior as well as in reaching specific goals. If a given behavior is sometimes reinforced and sometimes punished, depending on the whims of the teacher, it is not only confusing to the child but it is

impossible to make predictable progress. We have seen instances such as the following: the teacher has been consistently and smilingly calling on a youngster when he has raised his hand because she wished to increase the rate or his "hand-raising" behavior and thus his class participation. This has been going on for several days and the child is becoming more and more involved in class activities because he is reinforced for participation (hand raising). Suddenly one day the teacher responds to his hand raising by remarking, "What's the matter, Byron, must you always be the star of the show? Put your hand down and let someone else have a chance for a change." He does, of course, and it becomes fairly difficult to reinstate his full class participation. Teachers are all too human and absolute consistency would be virtually impossible. Yet if we are involved in a very conscious effort to help a child change undesirable behavior to more desirable behavior, it is essential that we be consistent. One of the strengths of the behavioral approach is that it forces us into a position in which we have to examine our own behavior and relate it to student outcomes.

5. Fifth, consequences should closely follow the behavior on which they are contingent. There should be as little delay as possible between the child's behavior and the consequences. Human beings do have the ability to delay reinforcement or punishment because they have verbal means to mediate this delay. In fact, teaching a child to delay gratification is one of the major jobs of parents and society. We tend to think of adults who cannot do this as immature and childish. People do learn to work for distant goals such as a college degree. However, a careful examination of the situation surrounding such long range activities would undoubtedly reveal many reinforcements along the way that tend to maintain the behavior.

In trying to gain, maintain, or eliminate specific behavior in the classroom, we will have much more effect on the behavior of the student by using immediate consequences than by using delayed outcomes. Delay may have deleterious effects, and this is probably more true of younger than of older children because younger children do not possess the verbal skills required to handle the delay. We have all known parents who promise their, say, five-year old child that if he is "good" all day (a nebulous goal), he will be rewarded in the evening. Of course, this is a very long delay for a small child. It is equally difficult for him to understand punishment that is delayed until his father gets home. The longer the delay, the less chance that the consequences are associated with the appropriate behavior. In fact, the reinforcement or punishment may become associated with stimuli that are not intended. For example, having a child stay after school and do his work as a form of punishment while his peers are playing and enjoying their freedom may result in getting the work done that time, but it may also make the work and school aversive. Scolding a student for something he has done earlier in the day when he has just come up to get help with his arithmetic may decrease the probability that he will seek help from the teacher the next time he needs it. In other words, outcomes must be planned, not just given at opportune moments. Surely one thing that is desirable in teaching is that the learner have positive feelings toward the teacher, the school, and the subject. Therefore, if we are to use consequences systematically, they must be carefully related to the behavior they are to change.

6. A sixth principle concerns the amount of reinforcement necessary for behavioral change. Most people underestimate this. Generally it is especially desirable to reinforce more frequently and with more potent reinforcers on tasks involving new learning. Later we will see that this point can be modified to maintain behavior.

In a previously cited study (Nolen, et al.) the researchers determined that the amount of reinforcement was a very significant variable in improving the learning rates of junior high school students with learning disabilities. The more reinforcement, the better the learning.

Sometimes this principle presents some difficulty because the reinforcement itself is so time consuming that any extension of it would seriously hamper the time for work. A common instance of this, employed by most teachers at one time or another, is to give a student time for "free reading" when he has satisfactorily completed some task. However, too long a period of free reading can markedly reduce the amount of time spent on more formal academic tasks for which a classroom environment is most appropriate.

One of the authors (M.L.M.) had a very cagey Latin teacher back in high school. There were three or four students who, because they were fairly proficient, were given the privilege of staying after school as a group and reading some of Cicero's letters. Somehow the group accepted this as a great reward, as recognition of their academic prowess, and they learned a lot more Latin (and history) as a consequence.

As one emphasizes a fairly heavy schedule of reinforcement only for new learning, he is actually making it more likely that there will be reinforcement for correct responses early in the learning sequence. It is important to do this to help prevent the student from emitting and practicing errors. For these early errors could become real barriers to learning later on in the sequence and increase the probability of failure to learn the more complicated material. Where succeeding steps depend on what has been previously learned and each step builds on the previous one as in a mathematical sequence, early reinforcement of correct responses is mandatory. This is handled fairly automatically in a programmed sequence in which the student is given immediate feedback as to the correctness of his responses. However, being correct is not always sufficient reinforcement and the teacher sometimes needs to supplement this with additional reinforcement. Then the student can move smoothly from one step to the next, both because he is correct and because he is recognized as successful.

7. A seventh principle is closely related to what has just been discussed. The student's work should be programmed (either formally or informally) so that there are many steps to be reinforced and the student can readily move from one step to the next. This approach is discussed in detail in Chapter 7 so we need not belabor the point here. A good program, and practically anything we require of the learner, can be presented sequentially and provides for an optimal amount of reinforcement and a minimal opportunity for error.

In this section we have discussed seven principles which are essential to the systematic modification of classroom behavior. They provide guidelines for adequate contingency management. In summary, they are: (1) Reinforcers are determined by their actual effect on the learner, not by their supposed affect. (2) Reinforcers affect behavior automatically. (3) Reinforcers should be clearly linked to the behavioral criteria of accomplishment. (4) Reinforcement should be administered consistently. (5) Reinforcement should follow immediately the behavior to be modified. (6) Reinforcement should be frequent and appear early in the learning sequence. (7) Reinforcement should be applied at each step of the learning sequence.

Kinds of Reinforcement

There are many ways in which we might classify those outcomes which will increase the frequency of responses. In this section we will take a look at one such system, expand our analysis of positive reinforcers, and then make a more detailed examination of some that have particular usefulness in the classroom. Again we will rely on both personal experience and research, and trust that the suggestions here will stimulate the creative teacher to new and even better ideas.

Bijou and Sturges (1959) have classified reinforcers into five categories; (1) consumables, (2) manipulatables, (3) visual and auditory stimuli, (4) social stimuli, and (5) tokens. We wish to add one more to this group which we will label "Premack" and will discuss a little later in the text. Thus, we will deal with six major categories of reinforcers.

While consumables have been used extensively in experimental studies, they do not lend themselves readily to the ordinary classroom. Usually parents have to be advised not to give their children breakfast, and this is not a very acceptable policy in most places. In addition, the distribution is sometimes a problem. However, if the reader is interested, he might well examine the study by Risley (1968), cited in Chapter 11, who used edibles and drinkables with great success to improve the social and verbal behavior of socially deprived four-year-olds. In this case the reinforcers comprised an excellent dietary supplement for the children.

Manipulatables, such as toys and trinkets, might have some value in a classroom especially with younger children. Hobby items tend to be more useful with older children and adolescents. One of our student teams found that a ten-year old girl who presumably was having difficulty with arithmetic was probably having more difficulty with communication. She was very shy and rarely volunteered anything. They discovered that her hobby was collecting bottle caps. It was not difficult to get a significant increase in spontaneous speech using bottle caps as reinforcers and pairing this reinforcement with praise.

Visual and auditory stimuli are frequently used as feedback to let the youngster know when he is right or wrong. This is difficult in the ordinary classroom although some sort of system could be built into an engineered classroom. However, we know one teacher who entered into a contract with a youngster in a sixth grade class. This boy was very disruptive in what seemed

to be an unthinking way. He talked too much and disturbed the other children with his noisy behavior. The teacher grew tired of reprimanding him, which was probably only reinforcing the behavior, so she set up a point system with which he could "buy" opportunities for game leadership, something he valued quite highly. This gave him the attention of the other students he so earnestly desired. She also installed a simple signal system to let him know when his behavior was appropriate and when inappropriate. This consisted of a paper disk hanging from a book end on her desk. It was green on one side and red on the other. If the green side was displayed "all systems were go" and the youngster knew that he was behaving within the limits, accumulating the necessary points to lead the team. However, if the red side was up he was losing points. This enabled him to become a self-controlled student and the system was no longer needed.

In the Risley study there was a need to get mothers involved in the teaching in order to have a more general effect on the children's behavior. The object was to obtain transfer of this behavior from school to the home, and it was hoped that the mothers would help bridge this gap. The researchers instructed the mothers to praise their children for successes, but these parents did not do so very readily. They were too accustomed to scolding the children and praise did not come easily. Part of the problem was a function of the mothers' working with their own children, but another factor was that there was no readily available outcome for the mothers themselves when they did give praise for a correct response. Their "praising behavior" was on extinction! In the second half of this research, the mothers were assigned to children other than their own and a red light flashed whenever they praised a child. Risley reports, "Under these revised conditions, all the mothers began to be much more liberal with praise. At the same time nagging and threats almost disappeared." The red light was an immediate indication that the mothers were doing the right thing. It was a potent reinforcer for their praising behavior.

Social stimuli comprise a very important category of reinforcers. Younger children are particularly influenced by the kind of responses they get from their teachers whether this be praise or punishment. However, a social outcome is almost always a significant factor in the behavior of students of any age. Social reinforcers comprise a significant part of what we might call "natural" reinforcers. That is, they are a common and usual part of social interaction and are not contrived, as are some that we discuss in this chapter. It should be the goal of these natural reinforcers rather than rely solely on those that have been contrived for a particular situation. This is accomplished by always pairing the token or whatever you are using with social approbation so that gradually the approval alone will be enough to maintain the desired behavior. Approval, like reproof, is easy to use. It is a natural and simple part of teacher-student relations. It is not used nearly enough.

Peer approval or disapproval also exerts powerful control over the behavior of many children. This is particularly true with the adolescent. For some adolescents the history of reinforcement in school has been so sparse and the aversive outcomes so heavy that the students do not respond to usual management techniques. However, they frequently respond to reinforcement given by peers. In some cases it is possible to help a student change his behavior by arranging the course of peer approval. This is much easier to do with

younger children than with adolescents. We have seen one teacher quickly stop the "silly" behavior of a nine-year-old boy by instructing his classmates to ignore it. The behavior was being maintained by their attention. The teacher then gave her approval for the appropriate behavior, and the boy was soon as well behaved as the rest of the class.

In another instance, this time involving a small class of emotionally disturbed children of about sixth grade level, the teacher hit on a method of providing a particularly obstreperous youngster with massive reinforcement from his peers. The entire class was on a point system with the points exchangeable for desirable activities. Points were earned for various academic and social behaviors. The teacher told the boy that if his behavior were adequate, and this was carefully spelled out, she would double the points for the whole class. When this happened and the other children were informed that they had double points that day because the one youngster had been able to be a "good citizen," they were lavish in their attention and praise of him. The beauty of this method was that the boy could not take anything away that the other students earned, his action could only make a very positive difference.

Recently Meacham and Gall (1968) prepared an annotated bibliography of research studies based on the use of behavior modification techniques with children in school settings. The studies were selected so as to exclude most of the work with very deviant children and concentrate on "normal kids in normal classrooms" as much as possible. We originally became interested in these studies when considering social reinforcement since many of them seemed to use this kind of reinforcement variable. Consequently, we decided to take a closer look at them and record for each age level the kind of reinforcement that the researcher had used. The results are in the following table. Note that we list six categories of reinforcement, having added "Premack" to the usual five categories of reinforcers. This Premack technique is explained fully later in the chapter.

The Behavior of the Behaviorist
Categories of Reinforcement for Various Age Levels
in 63 Research Studies

	Consumables	Manipulatables	Visual & Auditory	Social	Tokens	Premack
Preschool	4	6	0	14	1	1
Primary	0	2	2	6	0	0
Elementary	4	1	1	8	4	0
Jr. High	0	0	0	1	2	1
Sr. High	0	0	1	0	1	0
College	0	0	1	1	0	1
Totals	8	9	5	30	8	3

First a caution about this table. We do not suggest that this is a random sample of all the research done with children using behavioral techniques. These studies were selected because they tended to deal with normal children and young adults such as those we find in normal classrooms. We do feel, however, that we have a fairly representative sample.

Two things stand out when we take a close look at this table. (1) The predominant reinforcement used with relatively normal children in this sample of research studies has been the natural social reinforcer. If we think of token reinforcers as also involving social contact, then the figures are even more impressive. At any rate, almost half of these studies, all of which resulted in significant behavioral changes, used social rather than contrived reinforcers. (2) There is much more research reported with younger than older subjects. We evidently need to do a more thorough job of analyzing the behavior of adolescents. Much is written of this group but evidently very little of an objective behavioral nature, i.e., with the intent of systematically isolating the variables that are significant for enhancing learning.

Another kind of reinforcer, already alluded to several times, involves the use of tokens or some symbol that the learner can later trade in for something that he wants. These tokens may be gold stars, plastic discs, or any convenient object which the teacher dispenses for desired behavior. The token has real meaning only in terms of what it will "buy," so just how many are given for selected behavior depends on the teacher and his estimate of the sort of things that his students will work for. We have seen token systems in which students will work for. We have seen token systems in which students were paid off for accuracy and speed of academic responses. They could then buy toys with the accumulated points. There were several toys available but the point price of each was established so that a student could earn a fairly important toy in one day but had to spend several days of accumulated earnings for the more desirable expensive toys. This system has two things in its favor. First, it increases accuracy and speed, maintaining a high rate of student participation. Second, it teaches some students to delay satisfaction, something that becomes very important as we expect young people to work for long range goals.

We had an opportunity to observe another classroom (for retarded children) in which a mark system was in operation. Each child received a mark for any correct response. They accumulated these marks and could trade them in at any time for some desired activity. One adolescent girl liked to listen to the record player. She was allowed ten minutes at the record player for every twenty tokens. As she finished the requisite responses and received her tokens she went to the record player, put on the earphones and her favorite music, set the timer for ten minutes, and listened until the alarm sounded. Then she went back to work to earn more tokens. This girl had been labeled "trainable retardate" in a category oriented school setting. However, under this reinforcement system she was learning to read, write, and do arithmetic, skills that were thought impossible for her. Needless to say, she now had a teacher who didn't believe in limiting children by categories but who started with what the student could do and tried to take her further. This teacher's only complaint was that he had to spend so much time developing new materials as his "trainables" learned the old.

Tokens are often used in conjunction with the Premack principle (Premack, 1965). Simply stated, this means that a behavior that naturally occurs with a high frequency can be used as a reinforcer for a behavior with a low natural

frequency. Teachers have used this principle for a long time but have never bothered to give it a name or scientific validity. Such teachers find out what the child likes to do and then allow him time to engage in activity if his required work is accurate and has been accomplished within a set period of time. Probably the most common application of this principle is to let the child read his favorite book when he has finished his assigned work.

When the Premack principle is used in conjunction with tokens or points, it provides the teacher with a splendid opportunity to bring many different kinds of behavior under the reinforcement contingency. Points are allocated for academic responses as well as for desired social behaviors, and all of these add up to time in the desired activity. Once the child has accumulated the requisite number of points he can cash them in at any time. It is very important to allow the student to decide upon the cash-in period. Then it occurs at a time when he really wants to do something, thus maximizing the effect of the reinforcement.

Occasionally this results in a rather amusing side effect. In a nearby school a teen-age girl who was doing poorly academically and socially agreed to a point system which allowed her time out of class for relatively free play, reading, or whatever else she wanted to do. She started to accumulate points very rapidly but would not trade them in. At the end of several months during which her academic and social behavior improved markedly, she accumulated enough points for several days out of class. However, she did not want to trade them in. She preferred accumulating and recording them to spending them. At the time this is being written she is still accumulating points with no intention of using them. She likes school much more than she previously did and probably the social reinforcement of teacher praise has taken over the task of maintaining her behavior. Yet she is not quite willing to give up on the accumulation of points.

Generally, observers have found that under free-choice conditions, academic behavior has a lower probability of occurrence for most children than non-academic behavior. This provides an interesting insight into our educational system and is probably linked to the aversive nature of the usual classroom controls. In other words, when given the opportunity for free choice, most children would rather not do school work. They would rather do any one of a number of other things. It is by observing these freely chosen activities that the teacher learns what the youngster values most. We recommend observing the child's choice as well as asking him what he likes because children will often try to have their choice reflect what they think their teacher expects them to like. This may please the teacher but may not result in very effective behavioral management.

The teacher who is going to use the Premack principle in his classroom should develop for each child a hierarchy of behavior frequencies based on his observation of the free choices of the pupil. Once he obtains the hierarchy he can use those behaviors that occur most frequently to reinforce those that occur less frequently. Of course, safety and other factors should enter into the teacher's decision as to what preferred activities to permit. A typical hierarchy for a fourth grade boy might have some physical activity or sport at the top and reading at the bottom. Then the time permitted for

the sport is arranged so that it is contingent on a specified amount of reading. One must always assume, however, that the teacher is programming the reading materials in such a way as to enable the youngster to accomplish the academic goals sufficiently to allow him to participate in at least a minimum amount of athletic activity.

Let us refer back to the junior high school girl who was having behavioral problems in her science class. She earned tokens for adequate behavior and these were given to her at the end of each class. She used the tokens to buy time in group counseling sessions. Evidently she enjoyed these sessions because they provided an opportunity to talk about her problems. Prior to the token system, the counseling sessions had not changed her general behavior in almost a year. (It is possible the unearned sessions had actually reinforced the deviant behavior since this was the reason she was sent to counseling.) Once the token system was introduced, however, and she could go to counseling only if her behavior in science was adequate, she improved markedly. In another class she was similarly rewarded and used these tokens to buy time as an office worker. There was high status attached to such positions by the eighth grade girls, probably because of the high degree of visibility. She worked conscientiously in class in order to earn the privilege of working in the office. Given free choice, group counseling and office work were high frequency behaviors for this student. They became reinforcing for low frequency behavior (studying) through the mediation of a token system.

Another way of applying the Premack principle is through "high strength" areas in the classroom. Research at the Experimental Education Unit of the University of Washington employs this principle (see Haring and Hayden, 1966). Part of the classroom is designated as a "probable high strength area" and contains various games and toys which appeal to children of the class'general age group. The academic part of the classroom is designated as a "probable low strength area." This approach, as it is utilized at the E.E.U., is discussed in detail in Chapter 10.

High probability behaviors are powerful reinforcers and probably have not been investigated or utilized enough. They offer a particularly interesting way to motivate older teenage students. This is a highly active group usually interested in getting involved in activities that have some relevance to their goals and ideals. They are particularly prone to scorn "busy work." While many rebel against the system, it may very well be that the system does not seem particularly relevant to their goals. We have wondered, for example, why the very bright or gifted adolescent could not earn time out of school for other productive activity if he is capable of finishing the required academic work in three or four days a week instead of five. There are probably many alternatives to a full academic day that could enhance rather than hinder academic and social goals.

Earlier in this chapter we alluded to one of the most important of all reinforcers--teacher attention. Let us take a closer look at this very significant variable and examine further how it operates in the classroom.

Teacher attention, like any reinforcer, will maintain the behavior it follows. The little boy with the reading problem discussed earlier was being

heavily reinforced by teacher and other adult attention forhis reading problem. So it continued until we reserved attention for acceptable oral reading. The junior high school girl, after beginning her token reward system, remarked to the teacher, "The only time you paid any attention to me was when I was bad." She was able to state her need clearly and once this was satisfied by attention following desirable behavior, she changed dramatically. This suggests, incidentally, that the main power of a token or point system may be that it focuses teacher attention on the desired behavior. Perhaps the "real" reinforcer here is social and not the token or what it can buy.

Recent research also confirms the power of teacher attention in influencing classroom behaviors. Hall and others (1968) studied the effect of teacher attention on the study behavior of one first-grade and five third-grade children who had "high rates of disruptive and dawdling behavior." The investigators obtained baserates on three variables: (1) study behavior, (2) nonstudy behavior, and (3) teacher proximity. These data were gathered over a two week period with two to four thirty-minute observations each week on each child. The data were recorded at ten-second intervals. That is, the observer noted what the child was doing every ten seconds during the half hour rather than keeping a constant record of the child's behavior. This is easily accomplished by having an interval timer attached to a clipboard that gives a visual or auditory signal at the specified intervals.

The investigators then set out to change the teacher's behavior so that she would be giving attention (reinforcement) for appropriate behaviors. During the reinforcement period the observer would hold up a small square of colored paper and the teacher would use this as a signal to attend to the designated child both physically (moving closer, giving a friendly pat on the shoulder) and verbally. In this way it was possible for the observer to systematically control teacher attention. The changes in student behavior were quite convincing. From a baseline of about 25 percent, their study behavior increased dramatically to about 90 percent after only ten sessions of controlled reinforcement. To further demonstrate the effectiveness of teacher attention, the contingencies were reversed, i.e., the teacher returned to attending to nonstudy behavior. Contingency reversal is often used in research of this kind so that there can be no doubt that the independent variable is effective. As a result of the reversal in this research, the study rate of these children dropped back to 40 percent. Then reinforcement was reinstated for study behavior, the contingencies were reversed, and the study behavior increased again. The increased rate continued to hold up even after the cueing of the teachers was discontinued, suggesting that they had learned to attend more to study than to nonstudy behavior among their students.

This research was carried on in crowded classrooms in schools within an urban poverty area. However, the investigators report that the research procedures did not seem to interfere with the ordinary classroom routines. On the contrary, even after the investigators and teachers achieved their goals, the atmosphere in the rooms was greatly improved and the teachers had more time to devote to teaching.

Becker and his associates (1967) also studied the relationship between teacher attention and disruptive classroom behavior. Ten children from five

different elementary school classes served as subjects for this experiment. This particular school was also in an urban ghetto. The observers selected two children in each class who exhibited high rates of disruptive behavior and these became the "target" children for behavior modification procedures. Baseline measures showed that these children had an average deviant behavior rate of 62.13 percent, which seemed to bear out the original impression they made on the observers. Teachers were instructed, in general, to ignore the deviant behavior and give positive attention to the desired behaviors. As in the previous study, the teachers were to give praise and approval to the youngster when he was doing the "right" thing and ignore him when he was not. But this was to be done for all the children, not just the target children.

The experimental period lasted approximately two months and, while there was some variation among the ten children selected for specific study, the average rate of deviant behavior dropped to 29.19 percent. This is a substantial change from 62 percent. In addition, there were some beneficial side effects which, while not measured, were still rather obvious. The general tone of the classes improved markedly and there was much more time available for academic pursuits since so much less was spent in discipline.

The investigators also found that the children were helped when the modes or models of desirable behavior were explicitly pointed out by the teachers as they reinforced this behavior in other youngsters. By observing the reinforced youngsters, the more obstreperous ones learned how to receive positive teacher attention. This emphasis on positive teacher attention paid off in still another way. The teachers were so busy reinforcing desirable behavior that they had little time or opportunity to attend to the undesirable. This rather automatically put the deviant behavior on extinction and thus helped to maintain this aspect of the modification procedures.

The investigators concluded:

> The results of these investigations demonstrate that quite different kinds of teachers can learn to apply behavioral principles effectively to modify the behavior of problem children. These results extend to the elementary classroom, with normal teacher-pupil ratios, the importance of differential social reinforcement in developing effective social behaviors in children. Work now in progress suggests that rules alone do nothing and that simply ignoring deviant behavior actually increases such behavior. The combination of ignoring deviant behavior and reinforcing incompatible behavior seems critical.

It seems to us that these conclusions are particularly important for the teacher who is trying to use these techniques in the average classroom with the average number of children. It is not enough to just ignore the deviant child. In fact, this may be impossible, and it is likely that he will always get a little attention (reinforcement) for his deviant behavior. To most efficiently modify the child's behaivor, the teacher must reinforce an incompatible behavior. Study behavior is incompatible with nonstudy behavior. Quiet behavior is incompatible with talking. The child learns the incompatible behavior because it is the one that receives the reinforcement.

In another study, Thomas and others (1968) systematically varied teacher behavior in such a way as to produce or eliminate disruptive classroom behavior. (See Chapter 2 for the baseline data.) The class used in this research was once again an elementary school class with 28 children ranging in age from about seven to eight. The teacher was in her second year of teaching and volunteered for the project.

After the baserates were obtained on the various measures of student and teacher behavior, modification procedures began. These consisted of varying teacher approval and disapproval of student behaviors. In the initial baserate conditions, i.e., the natural classroom conditions, the student disruptive behavior occurred 8.7 percent of the time. During this time the teacher was responding to the students with 7.1 percent approval and 4.3 percent disapproval. The first experimental condition was "no approval." The teacher was instructed to try very hard not to approve of any student behavior and to increase her disapproval. She dropped her approval to .6 percent and increased her disapproval to 10.7 percent. Under these conditions of frequent disapproval and infrequent approval, the disruptive classroom behaviors climbed to 25.5 percent. One can see a "vicious circle" operating here. The more the teacher disapproved, the more the students misbehaved. After all, this was the behavior that got teacher attention.

Then the experimenters asked the teacher to return to baserate conditions. Disruptive behavior dropped to 12.9 percent, somewhat higher than the original baserate but significantly lower than under the first experimental condition. Next, the condition of no approval was reinstated and the disruptive behaviors rose to 19.4 percent, and then climbed still higher to 31.2 percent when she was instructed to be very disapproving.

Now this teacher was behaving as many of us might as a matter of course when confronted with a class full of problem behavior. Fortunately, we are now in a far better position to understand the processes which influence behavior, thanks to systematic examination of important variables. These investigators demonstrated that they could markedly alter the behavior of the children by changing the behavior of the teacher. The teacher could now take a more influential role in managing the classroom. They also noted, "The frequency of Relevant Behaviors was high whenever Approving Behaviors followed Relevant Behavior, and decreased wherever Approving Behaviors were discontinued." They go on to make two very interesting observations:

> First, the teacher who uses her Approving Behaviors as immediate consequences for good behavior should find that the frequency and duration of appropriate behaviors increase in her classroom (at least for most children). On the other hand, the teacher who cuddles the miscreant, tries pleasantly to get a child to stop behaving disruptively, talks with a child so that he "understands" what he is doing wrong, or who pleasantly suggests an alternative activity, is likely to find an increase in the very behaviors she had hoped to reduce.

We have included a fairly detailed look at the research reported in this chapter because it repeatedly demonstrates the validity of the basic thesis of this book: teacher behavior is closely related to that of the students and

the teacher does, for good or ill, influence the classroom. He has the potential for greater precision if he arranges important contingencies in a systematic manner. Probably the most important of these is his attention as manifested through approving and disapproving student actions.

Note that much of the research reported here has involved ordinary classrooms with the usual number of children. Teachers, albeit with observer-recorders, have modified the behavior of children consistently and significantly. The behavioral techniques do work in the usual classroom. It may take a little ingenuity to get the appropriate data and find adequate reinforcers, but this is only a challenge to the creativity and flexibility of the teacher. The system works.

By this point, the reader may surmise that a very close relationship exists between strengthening desirable behavior--the focus of this chapter--and eliminating undesirable behavior--the topic of the next. This tends to result in some unavoidable redundancy later on, though the emphasis will be rather different.

These same principles which we have been discussing hold when we are concerned with academic behavior. Reinforce that which is desirable, and extinguish that which is undesirable. Try marking only the correct responses on a spelling paper. Make them stand out, not the incorrect. Positive reinforcement is a teaching tool through which education can be converted from a trying experience to an enjoyable one. It would be quite an educational triumph if, in the usual hierarchy of probable behaviors, study behavior became so strong that it could be used as a reinforcement for nonstudy behavior, and a student would only be permitted to do his arithmetic after he had successfully completed recess.

Schedules of Reinforcement

No discussion of Precision Teaching would be complete without some reference to schedules of reinforcement. How much, how often, and when should we reinforce? We stated earlier that it is generally better to reinforce a child frequently but, while this general rule is true, it is often impractical. A teacher has only so much time to give to the 30 or so students in his class (about twelve minutes per student in a six hour day), and he cannot reinforce every response that the students make. However, we have seen that there are ways of building up the quantity of reinforcement. A point system for correct academic responses makes it certain that these will be reinforced even if the teacher is not present each time one is made. Not only can one arrange formally written programmed materials so as to enable the learner to respond correctly most of the time, but also he can add appropriate encouraging phrases as additional reinforcement. For example, on some teaching machines the student may be congratulated by the machine after a given number of correct responses. This is especially true with computerized instruction. It is almost as if another person is overseeing the student's work when the machine types back encouragement or even a reprimand.

Recently we were involved in a demonstration of computer techniques and were asked to engage in a dialogue with the computer wherein it would "ask"

questions and we would provide (hopefully) the appropriate answers. This series happened to be on the physics of light and the computer asked, "What major invention preceded the laser?" Trying to throw the machine off a bit, we typed back "The candle," whereupon the machine retorted, "Don't be ridiculous!" After that we gave reasonable answers.

It will probably be a long time before machines take over much of the teaching function and until they do, the teacher still has this problem of how much time to devote to reinforcing student behavior. In general, the teacher should reinforce most heavily when the student is learning a new task and less when he is maintaining a behavior that has been well learned. Therefore, for most academic work that involves new learning, reinforcement should be frequent and consistent on what is called a continuous schedule of reinforcement. Such a schedule requires that each correct response obtain reinforcement. If the learning task is reasonably well programmed so that the steps in the learning provide many opportunities for success, there is a built-in quantity of reinforcement since success provides automatic reinforcement for most students. If not, then a token system coupled with a generous amount of teacher approval may eventually makesuccess more reinforcing.

When the desired behavior is social rather than academic and is to be maintained over a long period of time, the teacher may turn to an intermittent schedule of reinforcement. In such a schedule, several correct responses may be required for reinforcement (ratio schedule), or a given time may have to elapse before it is given (interval schedule). As an example, let us assume that the behavior in question is class participation as indicated by a child's raising his hand in order to comment or answer questions. He has been rather heavily reinforced for hand raising by teacher approval (on a continuous schedule) until he has acquired a very high rate of this behavior. At this point the teacher wishes to "thin out" the reinforcement but still maintain the behavior. One way to do this would be to gradually decrease the number of times that the teacher called on this student (moving to a ratio or interval schedule), but to do this in a random and nonsystematic fashion. In other words, the child would not know when he was going to be called but would know just that he would be called if he continued to raise his hand.

Schedules of reinforcement, then, imply the rate at which reinforcement is dispensed for desired behavior. Since continuous reinforcement requires a reinforcement for each correct response, the ratio of reinforcement in a continuous schedule is often written 1:1.

Ratio schedules may be either fixed (FR) or variable (VR). In a fixed ratio, the subject obtains a reinforcer only after a given and fixed number of responses. Thus, if a child were required to solve five multiplication problems before being given his reinforcer (say, a token), he would be on a fixed ratio 5:1. However, if he were required to do seven problems before reinforcement, he would be on an FR 7:1.

A variable ratio schedule calls for reinforcement to be dispensed according to number of correct responses, but the number required is systematically varied. In some cases, the subject may have to make four responses (4:1) to

receive reinforcement, but the next time he may be required to make more, say six (6:1) and then eight (8:1). The number of responses required for reinforcement is averaged to determine the exact variable ratio schedule. In this case, 4:1 and 6:1 and 8:1 are averaged and the variable ratio is 6:1.

Interval schedules, generally less frequently used in education, provide for reinforcement to be obtained for the first response following a given interval of time, say ten seconds. Just as in ratio schedules, the time interval may be fixed or varied from time to time.

Very high rates of responding can be maintained by a variable ratio schedule. This schedule, as other intermittent schedules, is also far more resistant to extinction than continuous schedules. In other words, if a child is reinforced on a continuous schedule (1:1) but then reinforcement is discontinued, he will rapidly stop responding. However, he will continue to respond long after the discontinuance of reinforcement if he has been reinforced on a variable ratio schedule.

Let us look, now, at what happens when a teacher uses a fixed ratio schedule in maintaining hand raising behavior. We recently had a graduate student observing in a classroom in which the teacher complained of the lack of participation of one little boy in particular. He spent a significant amount of his time in nonstudy behavior and seemed to be paying little attention to the usual classroom procedures. While other children recited or answered questions, he gazed out the window or did other things that were very distracting to the teacher.

This teacher's method of gaining class participation was to call on the class in a fixed order. She started with one row, went completely through this, then on to the next. This was actually a fixed ratio schedule because the frequency with which a child's hand raising response was reinforced was fixed by the number of students in the class. Thus, if there were 30 students, the youngster in this example was on a fixed ratio of 30:1. Under this schedule there was a general current of unrest in the room although this little boy did stand out. When his turn came, he participated briefly and then went back to doing other things. It was highly likely that his nonstudy behavior was being highly reinforced by teacher attention. In this situation there was a long interval in which the only way the student could receive reinforcement was by doing those very things of which the teacher disapproved. When, with the encouragement of the observer, she changed her behavior and began to call on her class according to a much more variable schedule (variable ratio), the little boy's nonstudy behavior dropped off significantly. What we are saying here is that reinforcement is much more effective if it is certain but unpredictable. The economy of the state of Nevada rests to a significant extent on this very principle.

Fixed schedules of reinforcement do have a place in the classroom, however, when they are properly associated with the desired behavior. For example it might be very appropriate to teach a child better study habits by reinforcing him for fixed intervals of studying. He could be reinforced on a fixed interval basis, say every ten minutes, if during the period of observation, he had met the criteria for appropriate study behavior. Once this interval was

fairly thoroughly established, the teacher could increase the study time required for reinforcement and gradually build up study behavior so that it was a reasonable part of the child's repertoire. At this point, some variable schedule would become more appropriate for maintaining the behavior.

A common classroom practice is to offer the students some reinforcement after a fixed amount of work is done (a fixed ratio schedule) or after a specific period of time if the work is done. A major problem with the fixed ratio schedule is the tendency to reinforce speed rather than accuracy. So the teacher must be certain that the ratio is stated in terms of accurate responses, not just total number. In the case of the fixed interval schedule, there is a danger of reinforcing nonstudy behaviors because the brighter children will tend to dawdle during the first part of the interval and then work rapidly as the time runs out. Then one of the things being reinforced here would be "dawdling behavior" on the part of the bright student. Probably a fixed ratio schedule is best for most classroom activities where the teacher can stipulate that the reinforcement--for example, free reading--is available as soon as the student has done the required work accurately.

One final word about reinforcers. Many of them tend to "run out." There is probably a satiation principle applicable here much as there is with food. We think this is particularly true of the contrived reinforcers, although a token system avoids this to some extent by allowing the youngster several choices for his tokens. It is also probable that the natural reinforcers do not loose their properties so readily. We all seem to like lots of attention and approval and rarely seem to become satiated.

As teachers devote more attention to contingency management and utilize the principles espoused here, school will become a more positive experience for most children and learning will increase proportionately. Once positive reinforcement is given its rightful place in the teaching process, significant advances will occur in rates of learning and other aspects of academic achievement.

Reference: Stephens, T.M., Directive Teaching of Children With Learning and Behavioral Handicaps. Columbus, Ohio: Charles E. Merrill Pub. Co., 1970, pp. 50-53.

Teachers have access to a wide variety of reinforcers. Attention is a powerful reinforcer for many children. If a child gets attention for a certain act (response) he is likely to want to do it again. Approval, such as a pat on the back, nod of the head, saying "good" or "that's right," is a common reinforcer. Activities within the school program, such as recess and art, can serve as rewards for desirable performance. Other frequently used rewards are privileges, desired seating arrangements, additional time for enjoyable activities, and desired classroom duties. A number of factors should be considered in order to use rewards wisely.

Selection of Rewards/Rewards must be considered of value to learners if they are to be effective. Until the stimulus is viewed as reinforcing by the student it will have little effect on his responses. Youngsters who do not value school marks will be unwilling to perform if these are the only incentives

that are held out as rewards.

Teachers that believe some children are unmotivated are probably overlooking at least two facts about reinforcement. First, they have failed to understand that students are moved by reinforcers other than those used by the teachers. Second, responses expected of these children must be within their repertoires. That is they must possess the prerequisites for responding in the desired manner.

Rewards not only vary with individuals, they are also related to time and task. At a given time, or in a given setting, a reward may be less or more desirable to a particular student. In some instances, children find praise reinforcing but not under other conditions. For example, in the presence of peers, some children may be embarassed by praise fromteachers but not from other students. Others would find praise rewarding from either peers or teachers.

Task requirements may dictate what is reinforcing to a student. A smile may be sufficient for reinforcing a child's participation in group discussion, but it may be viewed as insufficient for demands expected of the same child in completing a difficult and time consuming arithmetic assignment.

The person who issues rewards is also a variable to be considered. A disliked teacher who provides a smile as a reward is probably viewed differently than a well-liked one who provides a smile for the same behavior.

It should be clear from this brief discussion that teachers must have knowledge of other factors concerning reinforcement in addition to the reward preference of a given student. They must know under which conditions students prefer specific rewards for a particular task.

Social Rewards/Teachers should begin with social rewards when initiating reinforcement procedures with a child for the first time. If social rewards are effective, they will have avoided difficulties caused by moving children from primitive rewards toward interim and social rewards. If these rewards are insufficient to influence their responses, then lower level rewards should be used.

New Rewards/Additional reinforcers can be developed through a procedure of pairing rewards with events (potential rewards). A frequent use of pairing contributes to creating many new reinforcers that can be used when needed. The process involves the systematic application of a reward for desired responses in association with a potential reward (see figure 3.1). By associating the two, the power of the first tends to transfer to the second, thus eventually creating an additional reward. The following illustration shows the use of pairing.

> Jasper responds positively to a soft pat on the back from his teacher but is oblivious to verbal compliments from afar. His teacher decided to pair a pat on the back (reward) with verbal compliments (potential reward). She began by approaching Jasper, patting him on the back and voicing approval for his good behavior. After having used the above procedure several times, she asked Jasper to come to

come to her whereupon she complimented him for his desirable conduct and patted him on the back. After having used this second approach four times, she began to alternate it with the earlier procedure. Soon she was able to praise Jasper from afar without the use of other reinforcement. It resulted in a more convenient way of managing Jasper in the classroom.

Internal Reinforcement/Instruction is effective when students find sufficient satisfactions in learning with a minimum of obvious reinforcement. When this occurs, rewards are internalized by the learners.

Other sources of internal reinforcement are found in a particular assignment or task that students enjoy, or in especially attractive instructional material that is rewarding to its users. Individuals who cannot account for reinforcement as a means of motivating students are searching for solely external rewards. They are ignoring the intrinsic rewards which may be contributing to the children's desirable responses.

Teachers should also recognize that some students persist in repeating easy tasks because ease and resulting feelings of success are internally rewarding. As task demands are increased, however, as is often the case when teaching new skills or concepts, internal rewards are no longer sufficient and more obvious external rewards are needed. In other words, when teaching children with learning and behavioral handicaps we should view those who do not need obvious reinforcement as not engaging in new learning because the present task demands are too easy.

Timing of Rewards/Reinforcement, to be effective, should occur simultaneous with the desired response or should immediately follow it. For this reason, school marks as typically used in report cards have little reinforcement value since reports to parents seldom occur frequently enough to be reinforcing.

When a child gives a correct response, his answer should be quickly reinforced if the teacher wishes to establish a connection between the stimulus and the response.

Frequency of Rewards/If a response is conditioned and is then reinforced less and less frequently, it will have greater lasting power and be more resistent to extinction. Initially, when establishing a connection between a stimulus and a response, frequent rewarding is often necessary. As the response becomes conditioned, however, reinforcement should not be presented everytime.

After getting Jasper to respond to praise, his teacher gradually reduced the frequency of the reward. Because he could not anticipate when praise would be forthcoming, Jasper behaved in a praiseworthy way for longer and larger periods of time.